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A

HANDBOOK

TO THE CASE ARRANGED AS AN INTRODUCTION

TO THE

STUDY OF BIRDS' EGGS.



PRICE ONE PENNY.

No. 896]

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I. VARIED COLOURING OF EGGS.

2



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1. House sparrow.
2 & 3. Sparrow hawk.
4. Osprey.

6

5. Robin.
6. Guillemot.

INTRODUCTION TO THE STUDY OF BIRDS' EGGS.

The arrangement of the specimens in this case is designed to encourage the observing rather than the mere collecting of birds' eggs, by illustrating some of the many interesting facts that may be learnt by the intelligent study of their characteristics.

It is necessary that the student should be acquainted with the appearance, at least, of the birds mentioned. With very few exceptions these birds may be seen in the general collection.

The eggs are discussed under the following heads :—

VARIED COLOURING OF EGGS.

PROTECTIVE COLOURING OF EGGS.

CLUTCHES.

SIZE OF EGGS IN COMPARISON WITH THAT OF THE BIRDS.

FORMS OF EGGS.

GRAIN OF THE EGGSHELL.

VARIED COLOURING OF EGGS.

Almost every shade of colour is represented in a large collection of birds' eggs. The pigment occurs only on the surface of the egg, and is deposited but a short time before it is laid.

White was probably the primitive colour of birds' eggs, as it is the colour of those of all reptiles.

The markings are usually most abundant at the larger end of the egg ; but some eggs, such as those of the Sparrow (*Passer domesticus*) and the Sparrow hawk (*Accipiter nisus*) are variable in this respect.

Young birds, especially of the Hawk family (*Falconidæ*), seldom lay eggs so richly coloured as those laid in their prime, but as old age advances the eggs again become less richly marked. In the three clutches exhibited the eggs of the first clutch are seen to be almost unmarked, those of the next more richly marked, and the last still more so.

It oftens happens, more particularly in birds that lay only two or three eggs, that nearly all the colouring is deposited on one or two eggs in a nest, the other eggs being nearly or quite unmarked. The unmarked egg appears to be, indifferently, either the first or the last one laid.

An extreme instance is here shown in a clutch of the Osprey (*Pandion haliaetus*), in which one egg is quite unmarked, and is also smaller in size.

The Robin (*Erithacus rubecula*) is a striking example of a bird laying several eggs of which one generally differs considerably from the rest of the clutch, in this case in having a lighter ground colour and more definite markings.

The eggs of some species of birds exhibit endless varieties of markings. This is strikingly the case in those of the Common Guillemot (*Uria troile*), no two eggs being quite alike. A series could be arranged from unmarked specimens to very richly marked. The twelve specimens exhibited show also that the markings may be either in blotches or streaks. A good example of variability in the ground colour is also found in the eggs of the same bird, which vary in this respect from white and stone colour to green and blue.

PROTECTIVE COLOURING OF EGGS.

It is difficult to account for the colouring of the eggs of many birds, but in those instances in which the eggs are laid in open and exposed situations the colouring is undoubtedly protective. The eggs of many birds that lay in holes and dark places are white. On the other hand, the eggs of pigeons, some of which build very open and exposed nests, are also white,

The Ptarmigan (*Lagopus mutus*) and Grouse (*Lagopus scoticus*) frequent heath-covered mountains and moors. The nest is a slight hollow lined with a little grass, heather, and a few feathers. The eggs are coloured in harmony with the surroundings.

The Kentish plover (*Ægialitis cantiana*) and Ringed plover (*Ægialitis hiaticola*) are examples of coast birds, which lay their eggs in slight hollows in the sandy shingle. The colouring of the eggs renders them most difficult to distinguish among the surrounding stones and pebbles.

II. PROTECTIVE COLOURING OF EGGS.



1. Ptarmigan.
2. Kentish plover.

3. Ringed plover.
4 & 5. Little tern.

The eggs of Terns, Plovers, and other birds which nest on bare ground, especially sand and shingle, are good examples of eggs which are blotched with half-tones as well as with more conspicuously coloured markings. The effect of these half-tones is to dissolve or break up the outline of the eggs and so to render them less conspicuous.

The eggs of the Nightjar (*Caprimulgus europaeus*) are laid on the bare ground, and form another good example of eggs with protective half-tones. A clutch of these eggs is shown in the next series.

The Coot (*Fulica atra*) is an inland water bird inhabiting reed-grown lakes. The nest is large and built of rushes and reeds. The eggs are the colour of the dead reeds among which they are laid. Examples of these and many other birds may be seen in the bird gallery at the British Museum, where they are mounted with their nests and eggs in their natural surroundings.

CLUTCHES.

A set of eggs found in a nest at one time is termed a clutch. There is a distinct tendency to uniformity between the eggs of a clutch: thus two clutches, laid by two birds of the same species, will be found to differ somewhat from each other, although all the eggs individually will have the same general character, and can be readily recognised as belonging to the same species of bird.

The number of eggs in a full clutch varies in different species of birds from one to as many as twenty. In many groups of birds the number is distinctive.

ONE.—When a clutch consists of only one egg, this is generally very large in comparison with the parent bird. The following are some examples of birds which lay but a single egg:—The Guillemot (*Uria troile*), Razor-bill (*Alca torda*), Great auk (*Alca impennis*), Puffin (*Fregata arctica*), and Stormy petrel (*Procellaria pelagica*).

Two.—A clutch of two eggs is constant among the Pigeons (*Columbiformes*), our common Nightjar (*Caprimulgus europaeus*), the Divers (*Colymbiformes*), and many Birds of Prey (*Accipitriformes*).

Two to THREE.—The Gulls (*Lariformes*) commonly lay either two or three eggs, as do many of the birds of prey; although some of the latter, such as the Sparrow hawk (*Accipiter nisus*) and the Short-eared owl (*Asio accipitrinus*) will sometimes lay from five to ten.

FOUR.—Nearly all the Plovers (*Charadriiformes*) lay four pear-shaped eggs, which are placed with their points together, and thus occupy a smaller area. Among the birds included in the *Charadriiformes* are the Snipe, Woodcock, Sandpiper, Stint, and Ruff.

FOUR TO SEVEN.—Most of the Perching birds (*Passeriformes*) lay four to seven eggs. But a few of these birds, such as some of the Tits (*Paridae*), may lay as many as ten or twelve eggs, which are the numbers sometimes found in the nests of the Long-tailed tit (*Acredula caudata*) and the Blue tit (*Parus caeruleus*).

TEN TO TWELVE.—Nearly all the Game birds (*Galliformes*), Rails (*Ralliformes*), and Ducks (*Anseriformes*) lay from about ten to twelve eggs in a clutch, or in some instances more. The Common partridge (*Perdix cinerea*) sometimes lays twenty eggs. It is probable that the number and size of the eggs laid by the Game birds and Ducks, together with their habit of making their nest on the ground, was the first inducement man had to domesticate these birds.

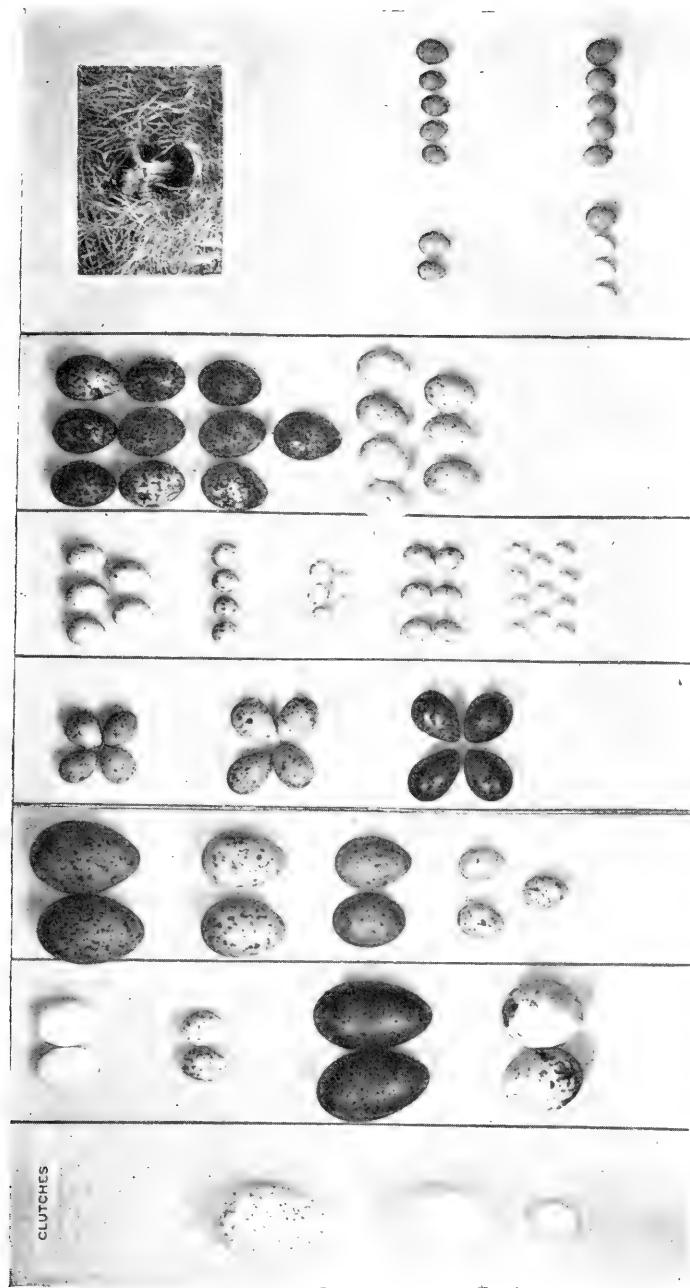
More than thirty eggs are sometimes found in the nest of the Ostrich (*Struthio camelus*), but the same nest is used by several hens, each of which lays about ten eggs. The eggs are incubated almost entirely by the male bird.

The Cuckoo (*Cuculus canorus*), as is well known, deposits an egg (of which she lays several) in the nest of some other bird, who hatches and brings up the alien. The offspring of the foster birds are ultimately turned out of the nest by the young cuckoo.

The egg is first laid on the ground by the cuckoo and afterwards conveyed in her bill to the nest of the chosen foster parents, which is most often one of the following: Pied wagtail (*Motacilla lugubris*), Tit lark or Meadow pipit (*Anthus pratensis*), Reed warbler (*Acrocephalus streperus*), Hedge sparrow (*Accentor modularis*), and Robin (*Erithacus rubecula*); but many other birds may be imposed upon.

The egg of the cuckoo may be a good match as to colour with those of the foster parents, as here shown in the clutches of the Garden warbler (*Sylvia hortensis*) and Whitethroat (*Sylvia cinerea*). The egg of the Cuckoo is, however, larger than the eggs of these birds.

III. CLUTCHES.



CLUTCHES

<i>On the.</i>	<i>Two.</i>	<i>Two to Three.</i>	<i>Four.</i>	<i>Four to Seven.</i>	<i>Ten to Twelve.</i>	<i>Cuckoo</i>
Razor-bill.	Ring dove.	Herring gull.	I. Ringed plover.	Song thrush.	Pheasant.	with
Puffin.	Nightjar.	Kittiwake.	Blackcap.	Water rail.	Garden warbler.	Whitethroat.
Stormy petrel.	Red-throated diver.	Richardson's skua.	I. White-tcat.	Wren.		Hedge sparrow.
Buzzard.	L. tern.		Y. Hammer.	Blue-tit.		

IV. SIZE OF EGGS IN COMPARISON WITH THAT
OF THE BIRDS.

SIZE OF EGGS IN COMPARISON
WITH THAT OF THE BIRDS.



Partridge.
Cuckoo.
Guillemot.

Snipe
Missel thrush.
Raven.

Blackbird.
House sparrow.
White-tailed eagle.

In other instances it is quite unlike in size and colour, as in the other examples shown, where the foster parents are the Wren (*Troglodytes parvulus*) and Hedge sparrow (*Accentor modularis*).

SIZE OF EGGS IN COMPARISON WITH THAT OF THE BIRDS.

The size of eggs is generally, but not at all constantly, in proportion to that of the parent. Eggs from which the young are hatched in a relatively fully developed state are large, as in the case of Game birds. The number of eggs to be covered by the bird must also be considered.

The Partridge (*Perdix cinerea*) lays twelve to twenty eggs in a nest, whilst the Common Snipe (*Gallinago coelestis*), although a much smaller bird, lays eggs of equal size to those of the Partridge ; but there are never more than four in a nest. The young of both of these birds are able to run as soon as hatched.

The Snipe (*Gallinago coelestis*) and the Blackbird (*Turdus merula*) differ but slightly in weight, but the eggs of the former are far larger than those of the latter. The young Blackbirds are helpless when hatched.

The Cuckoo (*Cuculus canorus*) and Missel thrush (*Turdus viscivorous*) are of about equal size, but the egg of the former is many times smaller than that of the latter, which is but little larger than that of the Sparrow (*Passer domesticus*). The young of all these birds are helpless when hatched. Although the egg of the Cuckoo is so comparatively small, yet it is not small enough to be inconspicuous amongst the eggs of the foster bird.

The Guillemot (*Uria troile*) and the Raven (*Corvus corax*) are of about equal size but the egg of the former is considerably larger than that of the latter. The Guillemot lays only one egg and the Raven from four to six. The young of both are helpless when hatched.

The White-tailed eagle (*Haliaëtus albicilla*) is five or six times larger than the Guillemot (*Uria troile*), but their eggs are of about equal size.

FORM OF EGGS.

Eggs of the same species, and even of the same parent, often show much variation in shape, but usually a certain amount of uniformity is maintained in each group of birds.

The various typical forms may be classified under the following heads :—

OVOID, PYRIFORM, BI-CONICAL, OVAL, CYLINDRICAL AND SPHERICAL.

OVOID.—The most familiar form is ovoid, that being the shape of the eggs of the Domestic fowl and of nearly all Game birds (*Galliformes*), also of the Gulls (*Lariformes*), Ducks (*Anseriformes*), and of most Perching birds (*Passeriformes*).

PYRIFORM.—Pear-shaped or pyriform eggs are especially characteristic of the Snipe, Plovers, and Sandpipers (*Charadriiformes*), the Guillemots and Great auk (*Aleiformes*).

Nearly all of the Snipes, Plovers, and Sandpipers lay four eggs in a nest, where they lie with points to the centre, thus occupying as little space as possible and being more easily covered by the brooding parent.

The Guillemot lays but one egg on a ledge of bare rock, no nest being made. The pyriform shape of the egg prevents it from rolling far. A knock or a rough wind only causes it to revolve, or roll in a small circle.

BI-CONICAL.—Eggs pointed at both ends or bi-conical are characteristic of the Grebes (*Podicipedidiformes*).

OVAL.—The eggs of the Nightjar (*Caprimulgus europaeus*) have both ends equally rounded, forming an almost true oval.

CYLINDRICAL.—The eggs of the Sand grouse (*Pterocleidae*) are elongated and almost cylindrical and bluntly rounded at each end.

SPHERICAL.—Eggs very nearly spherical are characteristic of the Owls (*Striges*) and some of the Picarian birds, as, for example, the Bee-eater (*Merops apiaster*) and the Kingfisher (*Alcedo isspida*).

The eggs of most birds of prey (*Accipitriformes*) approach this form.

GRAIN OF THE EGG-SHELL.

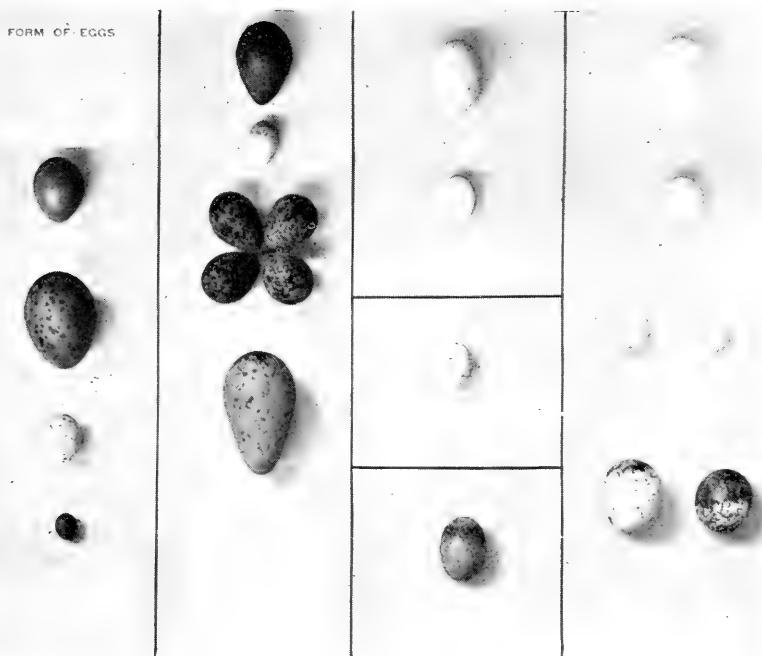
In certain families of birds the egg-shell exhibits a definite grain or texture which may be easily recognised, especially when magnified.

A difference of grain is in some cases distinctly visible even between species of the same genus (*see* Specific Differences).

According to the fineness or coarseness of the grain birds' eggs have a glossy or a dull appearance.

V. FORM OF EGGS.

FORM OF EGGS



Ovoid.

Pheasant.
L. Black-backed
gull.
Jackdaw.
Nightingale.

Pyriform.

Black-tailed god-
wit.
Sandpiper.
Lapwing.
Guillemot.

Biconical.

Great Crested-grebe.

Little Grebe.

Oval.

Nightjar.

Cylindrical

Sand Grouse.

Spherical.

Tawny owl.

Scop's owl.

Bee-eater. Kingfisher.

Honey- Kite.

buzzard

For convenience of study they are here grouped under the following heads :—

SMOOTH, GLOSSY, PORCELLANOUS, GREASY, CHALKY-FILM, DULL, and GRANULATED.

The eggs of the Ostrich (*Struthio camelus*) of South Africa are rough and pitted, whilst those of the North African Ostrich are quite smooth and free from any pit marks. The birds themselves present no differences and are regarded as one species.

SPECIFIC DIFFERENCES.—The eggs of the Mute swan (*Cygnus olor*) have very little gloss and are rough, but those of the Hooper or Whooper swan (*Cygnus musicus*) although about equal in glossiness are more coarse in texture. The eggs of the Grey lag goose (*Anser cinereus*) are smooth and dull, but those of the Bean goose (*Anser segetum*), are rough with just a little gloss. The Hooded crow (*Corvus cornix*) and the Black crow (*Corvus corone*) are by many ornithologists regarded as but different forms of the same species, yet the grain of their respective egg-shells differs very considerably from each other. It is even possible to distinguish by its grain the egg of a hybrid between these two crows.

SMOOTH.—The majority of birds lay eggs with a smooth surface, including nearly all the Game birds (*Galliformes*), Plovers (*Charadriiformes*), and Perching birds (*Passeriformes*).

GLOSSY.—The grain of the egg-shells of a large number of the Picarian birds (Kingfishers, Rollers, Hoopoes, &c.), and Woodpeckers (*Piciformes*) is so fine as to cause the surface to be glossy. The shell is also colourless and semi-transparent, so that the contents may be seen through the thin shell.

PORCELLANOUS.—The Tinamous (*Tinamiformes*) are an order of Central and South American birds, which in general form and habits resemble Game birds. The thick shells of their eggs are quite opaque, deeply coloured, and so highly glazed as to have a burnished appearance. Their eggs are quite unlike those of any other birds.

GREASY.—The eggs of all the Ducks (*Anseres*) have a greasy or oily surface ; this may be useful as a protection against damp, as the parent birds are continually in and out of the water.

CHALKY-FILM.—The eggs of the Grebes (*Podicipedidiformes*) and of all the Cormorants, Gannets, and Pelicans (*Pelecaniformes*), with the exception of the Tropic birds (*Phaethontes*), are covered with a

chalky-film sometimes of considerable thickness. This would serve in the case of the Grebes especially, as a protection against too much damp, their nest being built on the water, sometimes even floating.

DULL.—The eggs of the Auks and Razor-bills (*Alciformes*) and of many birds of prey (*Accipitriformes*) are without polish and dull.

GRANULATED.—The eggs of many of the Running birds (*Ratitæ*) are very coarse grained and rough, presenting quite a granulated appearance. This structure is also exhibited by the eggs of the Guinea fowl (*Numida meleagris*).

SOME OF THE BOOKS IN THE HORNIMAN LIBRARY WHICH RELATE TO BIRDS' EGGS.

CHAPMAN (F. M.).—Birds' Nests and Eggs: a Guide Leaflet to the Collection in the American Museum of Natural History. New York, 1904.

Birds' Eggs (pp. 11-13) : *Number of Eggs in a "Set" or "Clutch"*—*Size of Eggs (with plate)*—*The Shell*—*Colours of Eggs*—*Shape of Eggs*—*Individual Variations*.

HEWITSON (W. C.).—Coloured Illustrations of the Eggs of British Birds. Third edition. London, 1856. 2 vols.

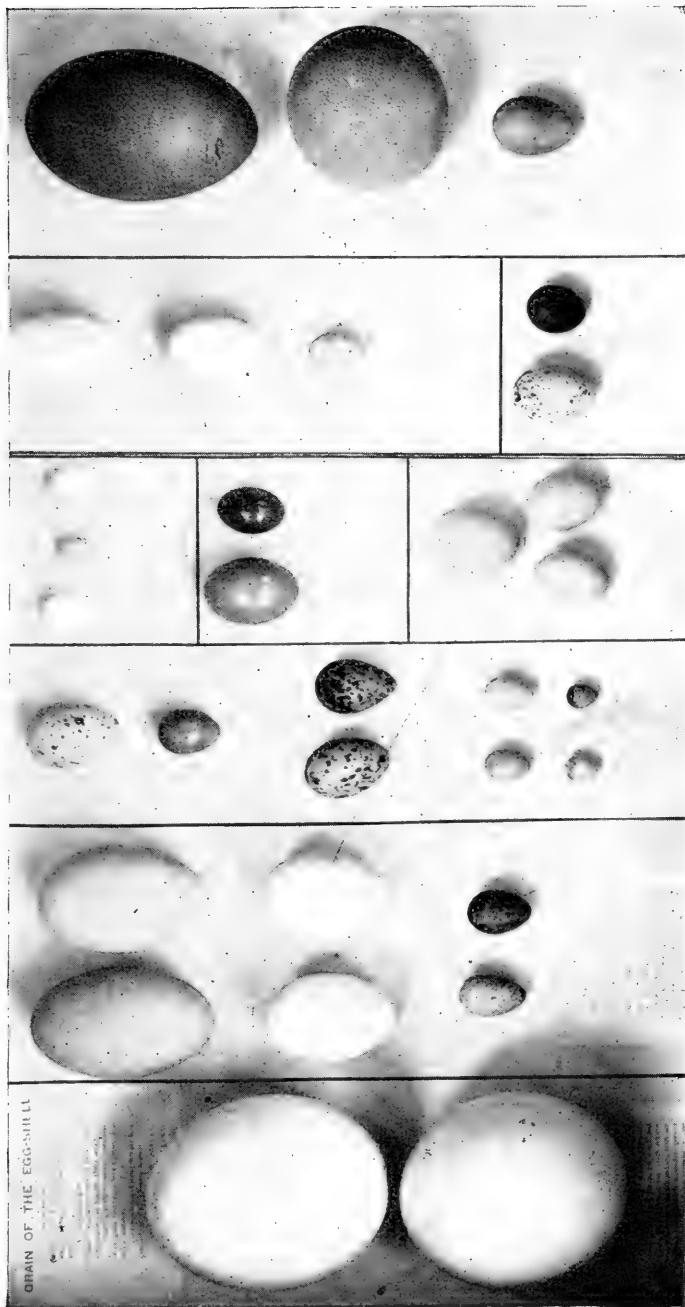
Introduction : *Pleasures of the Study of Birds' Eggs*, pp. v.-vi.—*Number of Eggs in a "Clutch,"* pp. vii. and x.—*Colours*, p. vii.—*Protective Colouring*, pp. viii.-x.—*The Size of Eggs*, p. x.—*The Study as an Aid to the Classification of Birds*, pp. xi.-xii.—*Individual Variations*, pp. xi.-xiii.

NEWTON (A.).—A Dictionary of Birds. London, 1893-96.

Eggs : *The Systematic Study of Birds' Eggs ("Oology")*, pp. 182-83—*The Study as an Aid to the Classification of Birds*, pp. 183-84—*The Earliest Collectors*, p. 184—*Colours*, pp. 184-86—*Nature of the Pigment*, pp. 187-88—*Protective Colouring*, pp. 188-89—*The Grain of Egg-shells*, pp. 189-91—*The Form of Eggs*, p. 191—*The Size of Eggs*, pp. 191-92.

Embryology : *Formation of the Ovum in the Ovary*, pp. 195-96—*The Ovum in the Oviduct*, pp. 196-97—*The Colour of the Shell*, p. 198—*Abnormal Eggs*, p. 198—*How the Egg is Laid*, pp. 198-99.

VI. GRAIN OF THE EGG-SHELL.



Specific Differences:

S. African Ostrich.

N. African Ostrich.

Mute and Whooper swan.

Grey Lag and Bean goose.

Hooded and Carrion crow.

Smooth.

Caperbillie.

Red-legged partridge.

Oyster catcher & Golden plover.

Jay and Magpie.

Red-backed shrike and Skylark.

Glossy.

Roller, Hoopoe and Green woodpecker.

Thamnion.

Black guillemot.

Chalky-film.

Gannet.

Cormorant.

Black Duck.

Granulated.

Emu.

Cassowary.

Guinea fowl.

Dull.

Grebe.

Wigeon and Shoveller.

OATES (E. W.) and S. G. REID.—Catalogue of the Collection of Birds' Eggs in the British Museum. London, 1901, &c. *In progress*, with many plates in colour.

POULTON (E. B.).—The Colours of Animals, their Meaning and Use. London, 1890.

The Colours and Markings of Birds' Eggs, pp. 61-67; 212-13.

SEEBOHM (H.)—Coloured Figures of the Eggs of British Birds, with descriptive notices. Sheffield, 1896.

SORBY (H. C.)—On the colouring-matters of the Shells of Birds' Eggs. Proceedings of the Zoological Society of London, 1875, pp. 351-65.

WALLACE (A. R.)—Darwinism. London, 1901.

The Origin and Uses of Colour in Animals. *The Colouration of Birds' Eggs*, pp. 212-17.

G. L. GOMME,

Clerk of the Council.





List of Publications dealing with the Collections in the Horniman Museum and Library.

- 1. A Guide for the use of Visitors to the Horniman Museum and Library.
- 2. A Handbook to the Collection arranged as an Introduction to the Study of Animal Life.
- 3. A Handbook to the Vivaria and Fresh Water Aquarium.
- 4. A Handbook to the Marine Aquarium.
- 5. A Handbook to the Cases arranged as an Introduction to the Study of Bird's Eggs.

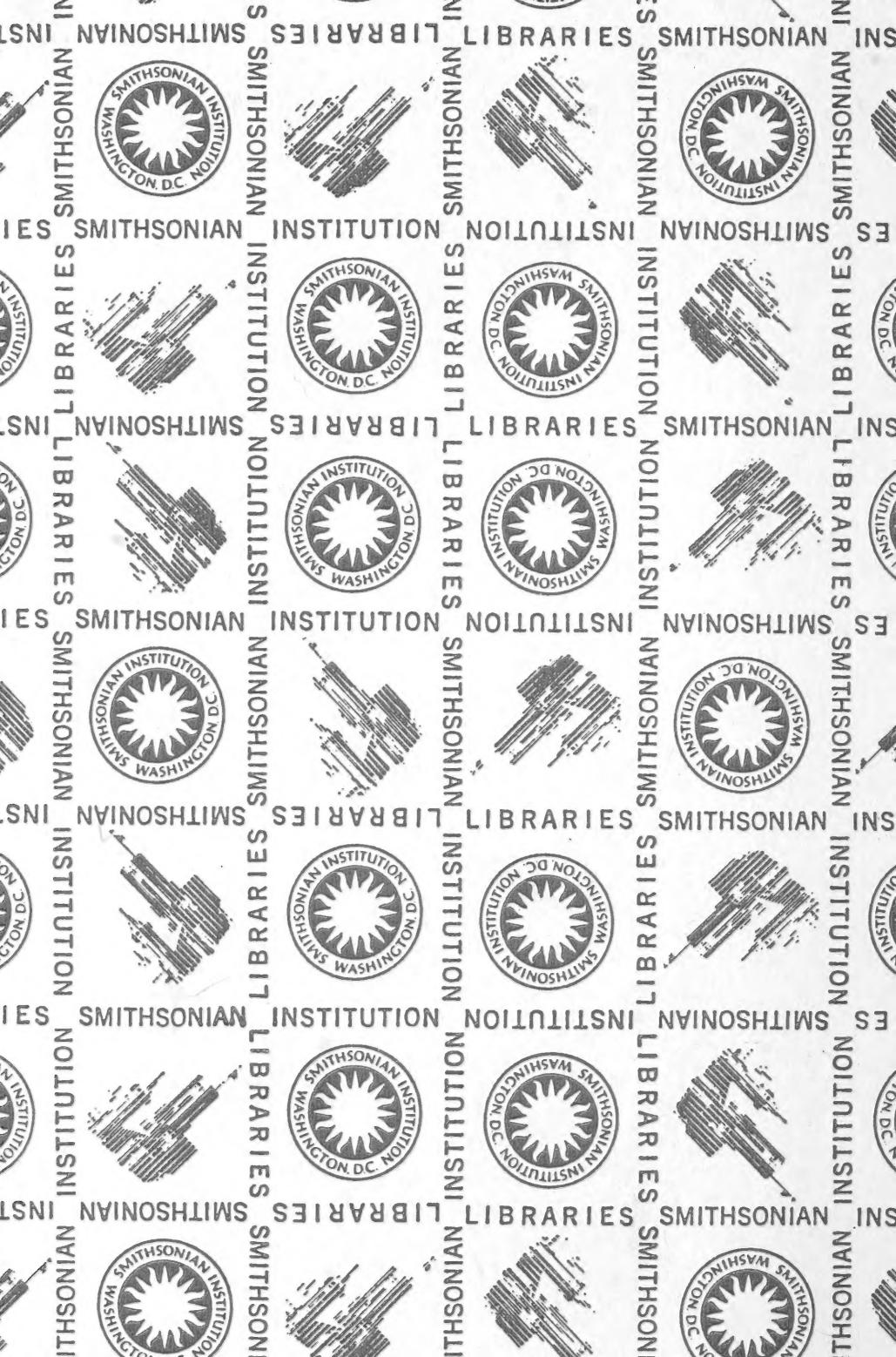
Books about the

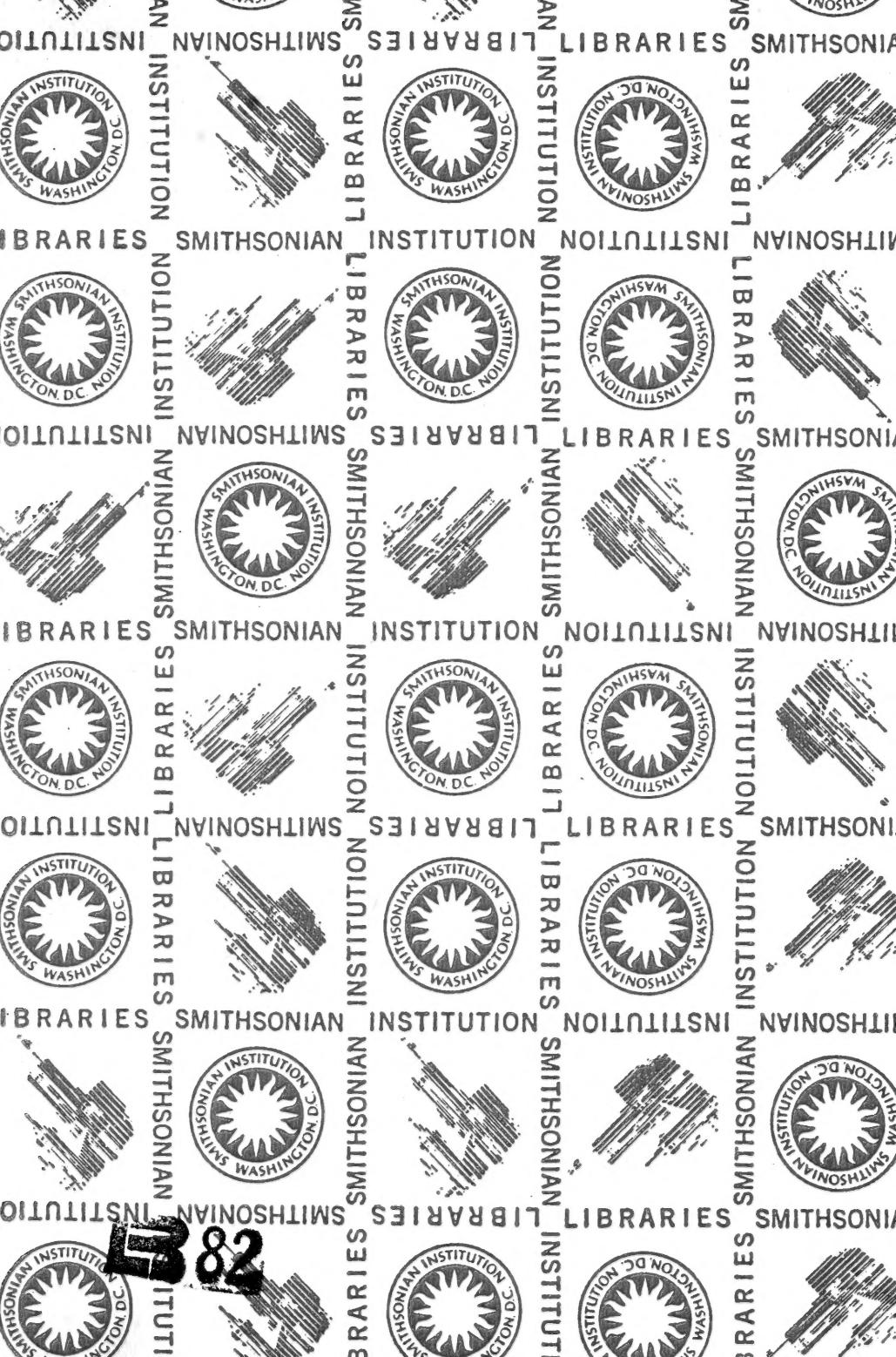
- 6. A Handbook to the Library.

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